

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
25 August 2005 (25.08.2005)

PCT

(10) International Publication Number
WO 2005/077834 A1

(51) International Patent Classification⁷: C02F 1/52, B01D
9/00, B01J 8/24 // (C02F 1/52, 101:10, 101:16)

(21) International Application Number:
PCT/CA2004/000208

Columbia V6K 2R1 (CA). MAVINIC, Donald [CA/CA];
5193 Cliffridge Avenue, North Vancouver, British Colum-
bia V7R 3V2 (CA). YONEMITSU, Noboru [CA/CA];
5554 Kings Road, Vancouver, British Columbia V6T 1K8
(CA).

(22) International Filing Date: 13 February 2004 (13.02.2004)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (for all designated States except US): THE
UNIVERSITY OF BRITISH COLUMBIA [CA/CA];
Industry Liaison Office, 103 - 6190 Agronomy Road,
Vancouver, British Columbia V6T 1Z3 (CA).

(72) Inventors; and

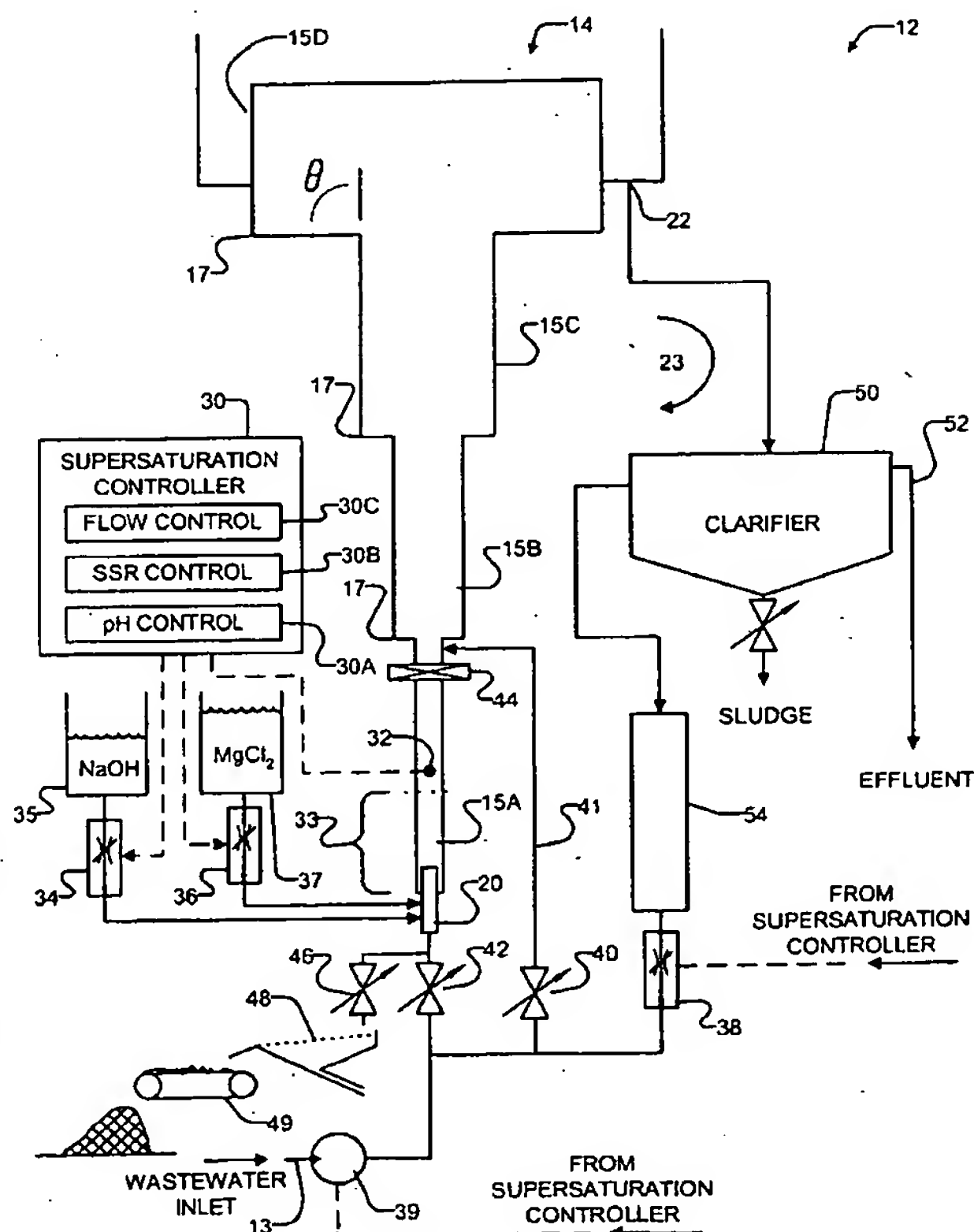
(75) Inventors/Applicants (for US only): KOCH, Fred
[CA/CA]; 2835 West 12th Avenue, Vancouver, British

(74) Agents: MANNING, Gavin, N. et al.; Oyen Wiggs Green
& Mutala, 480 The Station, 601 West Cordova Street, Van-
couver, British Columbia V6B 1G1 (CA).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SI, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

[Continued on next page]

(54) Title: FLUIDIZED BED WASTEWATER TREATMENT



(57) Abstract: A fluidized bed reactor (14) for removing phosphorus and nitrogen from wastewater has a column comprising a number of sections (15A, 15B, 15C, 15D). The diameter of the column changes stepwise between the sections. A flow velocity in excess of 100 cm/min is maintained in a lowermost one of the sections and lower flow velocities are maintained in subsequent sections. A struvite supersaturation ratio is controlled in part by recycling wastewater from an outlet of the column. Struvite pellets are removed periodically from the bottom of the column.

WO 2005/077834 A1



(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*